

## REMARKS

### I. AMENDMENT OF THE SPECIFICATION

The amendments to the specification are fully supported by the specification, drawings and claims as originally filed. No new matter is added, and entry of the amendments is respectfully requested.

The specification is being amended at page 7 to insert “isotropic” before “coefficient of thermal expansion”. This change is being made to achieve correspondence between terms used in the claims as amended and the specification, and is necessarily supported by information disclosed in the specification and claims as originally filed.

The Court of Customs and Patent Appeals stated in *In re Smythe*, 480 F.2d 1376, (CCPA 1973) that:

By disclosing in a patent application a device that inherently performs a function, operates according to a theory, or has an advantage, a patent applicant necessarily discloses that function, theory or advantage even though he says nothing concerning it. The application may later be amended to recite the function, theory or advantage without introducing prohibited new matter.

In particular, Applicants submit that information disclosed in the specification includes the information that: (i) the substrate is supported around its periphery by a portion of the upwardly inclined surface 48 of the wafer carrier (page 6, lines 8 to 10); (ii) the wafer carrier is subject to thermal expansion during processing (page 7, lines 6 to 8); and (iii) it is an object of the invention to provide a wafer carrier that prevents deposition on the backside of a substrate (page 3, lines 7 to 8). Thus, Applicantss submit that the disclosed information necessarily supports the amendment to the specification that the wafer carrier comprises an isotropic coefficient of thermal expansion, since anisotropic expansion of the wafer carrier would necessarily result in the peripheral edge becoming separated from the upwardly inclined surface 48 at some point resulting in deposition on the backside of a substrate.

## II. STATUS OF THE CLAIMS

Claims 1-6, 8-12, 24 to 28 are pending in the application, of which claim has been amended and claims 24 to 28 have been added.

Applicants submit that the subject matter of the amendment to claim 1 and added claims 24 to 28 is fully supported by information disclosed in the figures, specification and claims as originally filed for the reasons give above in connection with amendment to the specification.

As amended claim 1 includes the limitation that the “wafer carrier is comprised of a material having a coefficient of thermal expansion that enables the upwardly inclined surface to maintain contact substantially entirely around the peripheral edge of the substrate during processing at elevated temperatures.” This limitation requires that the wafer carrier be made of a material that: (i) expands substantially uniformly along all axis and in all directions, i.e., have an isotropic coefficient of thermal expansion; and (ii) have a coefficient of thermal expansion substantially equal to that of the substrate or wafer.

Added claims 26 to 28 provide that the substrate has a coefficient of thermal expansion in the same range as the wafer carrier; that the coefficient of thermal expansion of the substrate is in equal to that of the wafer carrier; and that the coefficient of thermal expansion of the substrate is isotropic. Applicants submit these claims do not raise new issues but rather are supported by, for example, the limitations of claim 1 as presented in response to the preceding office action, which provided inter alia that the substrate is comprised of a material having a coefficient of thermal expansion in the range of  $2.6 \times 10^{-6}$  to  $5 \times 10^{-6} / ^\circ \text{C}$ .

Applicant submits that the prior art references cited by the Examiner in the last office action of the parent application do not disclose, teach or suggest the above limitations. Thus, the Applicant respectfully submits that the pending claims are novel and non-obvious over the cited references singularly or in combination.

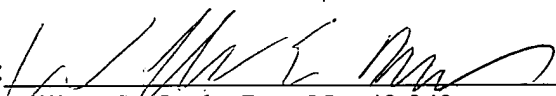
## CONCLUSION

For the foregoing reasons, Applicants respectfully submit that the pending claims are novel and non-obvious over the cited references singularly or in combination. An early notice of allowance of all claims is respectfully requested.

If any matters can be handled by telephone, Applicants requests that the Examiner telephone Applicants' attorney at the number below.

The Commissioner is authorized to charge any additional fees, including fees for extension of time, to Deposit Account No. 06-1300 (Order No. A-64873-1/MSS/WEN).

Respectfully submitted,

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**Appendix of Pending Claims**

**Amend. Filed:** 07/18/01

**Serial No.:** 09/457,929



VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph beginning at page 7, line 3, has been amended as follows:

To maintain the desirable line or point contact with the peripheral edge of the wafer and to provide secure support of the wafer, the thermal expansion of the wafer carrier is considered. Preferably, little thermal expansion occurs during the process so that the desired angle of the incline is preserved. Specifically, the wafer carrier is comprised of a material having [a] an isotropic coefficient of thermal expansion in the range of  $2.6 \times 10^{-6}/^{\circ}\text{C}$  to  $5 \times 10^{-6}/^{\circ}\text{C}$ , with the lower values preferred. Materials with suitable coefficients of thermal expansion include silicon and silicon carbide.

IN THE CLAIMS:

Claim 1 has been amended as follows:

1. (Amended) A wafer carrier for supporting a substrate, comprising:

a circular plate having a flat edge region extending around the circumference of said plate;  
and

a circular recessed center region having a recessed bottom surface and including an upwardly inclined surface around the periphery of said recessed bottom surface,

wherein the substrate is supported by a portion of the upwardly inclined surface and is spaced apart from said recessed bottom surface such that the substrate is supported by said wafer carrier only around [the entire periphery] a peripheral edge of the substrate, and

wherein said [substrate] wafer carrier is comprised of a material having a coefficient of thermal expansion [in the range of  $2.6 \times 10^{-6}$  to  $5 \times 10^{-6}/^{\circ}\text{C}$ ] that enables the upwardly inclined surface

**Appendix of Pending Claims**

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to maintain contact substantially entirely around the peripheral edge of the substrate during processing at elevated temperatures,

whereby deposition on a backside of the substrate is substantially prevented.

Claims 24 to 28 have been added as follows:

24. (Added) The wafer carrier of Claim 1 wherein said material of the wafer carrier comprises an isotropic coefficient of thermal expansion in the range of  $2.6 \times 10^{-6}$  to  $5 \times 10^{-6}/^{\circ}\text{C}$ .

25. (Added) A wafer carrier for supporting a substrate comprising:

a circular plate having a flat edge region extending around the circumference of said plate;  
and

a circular recessed center region having a recessed bottom surface and including an upwardly inclined surface around the periphery of said recessed bottom surface,

wherein the substrate is supported by a portion of the upwardly inclined surface and is spaced apart from said recessed bottom surface such that the substrate is supported by said wafer carrier only around a peripheral edge of the substrate, and

wherein said wafer carrier comprises a material having an isotropic coefficient of thermal expansion in the range of  $2.6 \times 10^{-6}$  to  $5 \times 10^{-6}/^{\circ}\text{C}$ .

26. (Added) The wafer carrier of Claim 25 wherein said substrate comprises a material having a coefficient of thermal expansion in the range of  $2.6 \times 10^{-6}$  to  $5 \times 10^{-6}/^{\circ}\text{C}$ .

27. (Added) The wafer carrier of Claim 25 wherein said material of the substrate comprises a material having a coefficient of thermal expansion substantially equal to that of the wafer carrier.

28. (Added) The wafer carrier of Claim 25 wherein said material of the substrate comprises an isotropic coefficient of thermal expansion.